

Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

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| Applicant's or agent's file reference 44 343A | FOR FURTHER ACTION | | See Form PCT/IPEA/416 |
| International application No. PCT/EP2004/008048 | International filing date (day/month/year) 19.07.2004 | Priority date (day/month/year) 29.07.2003 | |
| International Patent Classification (IPC) or national classification and IPC G01S7/52, G01N29/10, G01N29/26, G01S15/89 | | | |
| Applicant GE INSPECTION TECHNOLOGIES GmbH | | | |

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|---|-------------------------------------|---|---------------------|--------------------------|------------|----------|--------------------------|-------------|--|--------------------------|------------|----------------------------|-------------------------------------|-----------|---|--------------------------|------------|-------------------------|--------------------------|-------------|--|--------------------------|--------------|---|
| <p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>7</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (<i>sent to the applicant and to the International Bureau</i>) a total of <u>12</u> sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (<i>sent to the International Bureau only</i>) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>4. This report contains indications relating to the following items:</p> <table> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table> | <input checked="" type="checkbox"/> | Box No. I | Basis of the report | <input type="checkbox"/> | Box No. II | Priority | <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability | <input type="checkbox"/> | Box No. IV | Lack of unity of invention | <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement | <input type="checkbox"/> | Box No. VI | Certain documents cited | <input type="checkbox"/> | Box No. VII | Certain defects in the international application | <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | Box No. II | Priority | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | Box No. VI | Certain documents cited | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application | | | | | | | | | | | | | | | | | | | | | | |

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| Date of submission of the demand | Date of completion of this report |
| Name and mailing address of the IPEA/EP | Authorized officer |
| Facsimile No. | Telephone No. |

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/EP2004/008048

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

This report is based on translations from the original language into the following language _____ which is the language of a translation furnished for the purposes of:

international search (Rule 12.3 and 23.1(b))
 publication of the international application (Rule 12.4)
 international preliminary examination (Rule 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

the international application as originally filed/furnished
 the description:
 pages 4-14 as originally filed/furnished
 pages* 1-3, 3a, 3b received by this Authority on 12.07.2005 with letter of 07.07.2005
 pages* _____ received by this Authority on _____

the claims:
 nos. _____ as originally filed/furnished
 nos.* _____ as amended (together with any statement) under Article 19
 nos.* 1-22 received by this Authority on 12.07.2005 with letter of 07.07.2005
 nos.* _____ received by this Authority on _____

the drawings:
 sheets 1-8 as originally filed/furnished
 sheets* _____ received by this Authority on _____
 sheets* _____ received by this Authority on _____

a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. The amendments have resulted in the cancellation of:

the description, pages _____
 the claims, nos. _____
 the drawings, sheets/figs _____
 the sequence listing (*specify*): _____
 any table(s) related to sequence listing (*specify*): _____

4. This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

the description, pages _____
 the claims, nos. _____
 the drawings, sheets/figs _____
 the sequence listing (*specify*): _____
 any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

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| International application No. |
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| Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
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1. Statement

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|-------------------------------|--------|--------------------------------|-----|
| Novelty (N) | Claims | <u>2-5, 7-15, 17, 18, 22</u> | YES |
| | Claims | <u>1, 6, 16, 19-21</u> | NO |
| Inventive step (IS) | Claims | <u>4, 5, 9-15, 18</u> | YES |
| | Claims | <u>1-3, 6-8, 16, 17, 19-22</u> | NO |
| Industrial applicability (IA) | Claims | <u>1-22</u> | YES |
| | Claims | | NO |

2. Citations and explanations (Rule 70.7)

1. The documents (D) cited in the international search report are numbered (D1-D6) according to the sequence in which they appear in the search report.

2. The subject matter of **claims 1, 6, 16 and 19-21** lacks novelty over the disclosure of D1 (PCT Article 33(2)).

2.1 D1 discloses all the features of **claim 1**, as follows:

(a) method for processing signals which are generated during the non-destructive testing of objects such as pipes or sheet metal, by reflecting ultrasonic waves off defective points in the structure of the object (D1: claim 1, preamble), comprising the following method steps:

(b) emitting a complete wave front (this feature is non-restrictive, since a wave front is always complete) onto at least one section of

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Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

the object to be tested using a number of independent transmitting elements (D1: claim 1, paragraph a));

(c) receiving a wave reflected by the structure of the object using a number of independent receiving elements (D1: page 5, lines 1 and 2);

(d) digitising the signals received by the receiving elements (D1: claim 1, paragraph d, the allocation to storage spaces implies prior digitisation);

(e) storing the digitised signals in a storage element according to amplitude and propagation time (D1: page 5, lines 2-15);

(f) the defective points being recognised by a phase-locked addition of the stored amplitude values according to propagation time (D1: claim 1, paragraphs d and f; page 4, line 3).

2.2 Since **claim 16** defines the device corresponding to claim 1, the objections raised under point 2.1 likewise apply.

2.3 D1 also discloses the additional features of **claims 6 and 19-21**, as follows:

(a) **claims 6, 20**: D1: page 4, lines 11-18;

(b) **claim 19**: D1: see figure 1; claim 1, paragraph a);

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

(c) **claim 21:** D1: see figure 1.

3. The additional features of **claims 2, 3, 7, 8, 17 and 22** are considered non-inventive in relation to the disclosure of D1 in conjunction with common general knowledge in the art (PCT Article 33(3)).

3.1 The additional features of **claim 2** consist in recognising a defective point on a surface of the object facing the probe by evaluating the point wave signals emitted at the defective point.

According to D1, page 4, lines 1-12, the area to be tested is marked ABCD (see figure 1). If a person skilled in the art wanted to recognise a defective point on the surface of the object, he would place the surface in the area to be tested, possibly using a suitable spacer. Since, however, (Huygens') point wave signals are always emitted at defective points, a person skilled in the art would always evaluate those point wave signals.

The subject matter of the claim therefore cannot be considered inventive.

3.2 The additional features of **claim 3** consist merely in applying the method defined by claim 1 so as to recognise a defective point on one of the surfaces. In line with the comments made under point 3.1, this cannot be considered inventive.

3.3 The additional features of **claims 7, 8, 17 and 22** are considered to be common measures in the art

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
and are therefore likewise non-inventive.

4. The subject matter of independent **claim 10** concerns the detection and storage of the contour of a surface of an object to be tested by emitting a complete wave front and the triggering of independent transmitting elements such that the emitted wave front is parallel or approximately parallel to the contour of the surface of the object.

D1 discloses the contour recognition of defective points using the method defined in claim 1 (see the abstract, lines 10-12; page 6, lines 9-11). The transmitting of a wave front parallel to the surface of the object is neither disclosed nor suggested, since the probe is moved to different positions during the measurement process. A person skilled in the art would therefore simply follow the contour of the surface and would not undertake the beam shaping claimed in claim 10.

The methods disclosed in documents D3 and D4 concern the adaptation of the beam characteristic to the surface to be investigated. Here also, however, the probe is moved into different positions and therefore the emitting of a wave front parallel to the surface is not suggested. Document D2 shows a probe which consists of 24 elements and is adapted to the surface of the contour to be tested. Since adaptation is automatically carried out by the complex

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Box No. V **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**
structure, the method claimed in claim 10 is also not suggested.

The subject matter of independent claim 10 is therefore considered novel and inventive (PCT Article 33(2) and (3)). The same applies to **claims 11-15**, which are dependent on claim 10.

The additional features of **claim 9** correspond to the features of claim 10 that are considered inventive and are therefore also considered novel and inventive. Furthermore, the additional features of **claims 4, 5 and 18** are not disclosed or suggested by any of the prior art documents cited in the search report. The invention claimed in claims 4, 5 and 18 is therefore also considered novel and inventive (PCT Article 33(1) to (3)). In addition, the subject matter of all the claims is industrially applicable (PCT Article 33(4)).

5. It is also pointed out that the method detailed in the description, which is based on the emission of a **single** complete wave front, is not disclosed by D1. However, the scope of protection defined by claim 1 does not cover only such a method or device.